



**Testimony  
Before the Committee on Transportation and  
Infrastructure  
Subcommittee on Aviation  
United States House of Representatives**

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**CDC Efforts to Prevent Pandemics by  
Air Travel**

*Statement of*

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**For Release on Delivery  
Expected at 2:00PM  
Wednesday, April 6, 2005**

Good afternoon, Mr. Chairman and members of the Subcommittee. I am Dr. Anne Schuchat, Acting Director of the National Center for Infectious Diseases (NCID), Centers for Disease Control and Prevention (CDC). Accompanying me today is Dr. Ram Koppaka, Associate Director for Planning, Policy and Preparedness, NCID's Division of Global Migration and Quarantine. I am pleased to be here to discuss the important public health topic of mitigating the spread of infectious diseases by air travel. Infectious diseases do not recognize borders. In this age of expanding air travel and international trade, infectious microbes are transported across borders every day, carried by infected people, animals, animal products, insects, and food. CDC is committed to preventing the introduction of infectious agents into the United States. Because one route of introduction is air travel, and because of multiple outbreaks currently going on elsewhere in the world, today's hearing is particularly timely.

### **Diseases that could cause a pandemic**

A *pandemic* is broadly defined as an epidemic occurring over a very wide area, crossing international boundaries and usually affecting a large number of people. HIV is an example of a current and ongoing pandemic. Other diseases that could cause a pandemic with high rates of morbidity and mortality among the population include dengue, influenza caused by certain strains of influenza virus, plague, severe acute respiratory syndrome (SARS), yellow fever and select agents that could be used in a bioterrorist attack. These diseases are capable of causing a pandemic because of the ease of their transmissibility among people,

the severity of the illness they cause, the low level of immunity among the population, and the ease and speed with which people travel. There are other diseases, such as tuberculosis, meningococcal disease, and measles, that may pose less of a threat of causing a pandemic but are of significant public health concern because of their ease of spread from one location to another. These diseases could cause high rates of morbidity and mortality within a community.

Under authority delegated by the Secretary of the Department of Health and Human Services (HHS), the director of CDC is empowered to detain, medically examine, or conditionally release individuals reasonably believed to be carrying specific communicable diseases. These “quarantinable” diseases include cholera, diphtheria, infectious tuberculosis, plague, smallpox, yellow fever, and viral hemorrhagic fevers. SARS was added to the list by Executive Order 13295 in 2003, and on April 1 the President added influenza caused by novel or reemergent influenza viruses that are causing, or have the potential to cause, a pandemic to this list.

### **Volume and Speed Patterns of Global Migration**

The dynamics of international travel have changed dramatically over the past 150 years. There used to be a relatively small volume of international travel, and it took almost a year to circumnavigate the globe. Today, the volume of international travel has risen by orders of magnitude and continues to rise to over 760 million annual international arrivals according to the World Tourism Organization. Today it takes less than 24 hours to travel to almost anywhere

around the world; this is shorter than the incubation period for most communicable diseases. Over the past 14 years the largest increases in the volume of international travel have occurred in travel to Europe. However, the largest proportional increase in travel has been to East Asia and the Pacific Islands; this represents approximately a 30% increase over this time period. Because of the variety of infectious disease threats that exist in the world and the volume of people traveling internationally, the threat of infectious disease introduction and rapid spread is real.

### **Critical Control Points**

To respond to the threat of an introduction of an infectious disease that could cause a pandemic in the United States, HHS and CDC have been enhancing our nation's ability to detect emerging or reemerging pathogens, strengthening our presence and ability to respond at our borders, and building partnerships globally.

The best strategy for preventing disease introduction into the United States is through disease surveillance, early detection and rapid response. When we discuss prevention of illness by air travel, we are concerned about several different migrating populations entering the United States, including international travelers, immigrants, refugees, and asylum seekers. Preventing the importation of an infectious disease into the United States must address all these groups at these critical points: pre-departure, in-transit or upon arrival, and post-arrival.

### *Pre-departure Prevention*

Pre-departure prevention includes health education at home prior to travel.

CDC's travelers' health web site is a critical tool used to educate both health care providers and the public about the ways to prevent illness while traveling or living abroad. This website receives over 13 million hits per year and is accessed by people all over the globe. CDC posts travel notices and other important travel information to this website. Travel notices are tiered notices to inform travelers of health events taking place globally and steps they can take to avoid infection.

The first level of notice, *In the News*, includes reports of sporadic cases of particular illnesses. The next level, *Outbreak Notices*, informs travelers of outbreaks that are occurring in limited geographic settings. The third level, *Travel Health Precautions*, can be issued in the event an outbreak's geographic distribution widens and the risk to a traveler is thought to be increased. The highest level of notice, a *Travel Health Warning*, can be issued when the U.S. government feels non-essential travel to an area should be avoided. This advice was issued during the SARS outbreak in 2003.

*Information for International Travel* is a biennial publication written by CDC staff and other experts that serves as the gold standard for travel health recommendations within the United States and elsewhere. Bilateral communications between those at the World Health Organization (WHO) responsible for health information for international travelers and those at CDC

provide for the most accurate information both on the web site and in other communications.

Pre-departure prevention can be improved through surveillance for infectious diseases among traveling populations. GeoSentinel is a global network of 30 travel and tropical medicine providers established in 1995 by the International Society of Travel Medicine (ISTM) and CDC. GeoSentinel clinics are ideally situated to effectively detect geographic and temporal trends in morbidity among travelers, immigrants and refugees. Sites participate in surveillance and monitoring of all travel-related illnesses seen in their clinics. Sites were added recently in China, Japan and Singapore. In addition, CDC partners with ISTM and their network of members to informally provide leads and contacts when they encounter any patient having a concerning diagnosis or unusual event. This program allows large numbers of individual members in many countries to be rapidly linked together to share clinical observations and facilitates direct interaction with health authorities. CDC also partners with TropNetEurope, an electronic network of 46 clinical sites designed to effectively detect emerging infections of potential regional, national or global impact at their point of entry into the domestic population. TropNetEurope can serve as a tool to alert Public Health authorities and trigger further cluster investigation. Other communication networks are used to detect events that may be occurring among mobile populations. For example, through *Epi-X*, CDC's web-based communications tool for public health professionals, CDC officials, state and local health

departments, poison control centers, and other public health professionals can quickly and securely access and share preliminary health surveillance information. Users can also be actively notified of breaking health events as they occur.

In addition, CDC partners with the private sector. During the 2003 SARS outbreak, weekly teleconferences were held with the medical committee from Air Transport Association (ATA) providing SARS updates. CDC has an open invitation to ATA medical meetings that are held quarterly. Agenda items are added as appropriate regarding changes in guidance for prevention of infectious disease transmission as it relates to air travel. CDC and HHS also work closely with other international health authorities including ministries of health and WHO.

Approximately 1 million immigrants and refugees enter the United States annually and, unlike travelers, undergo a medical exam. Under the authority of the Immigration and Nationality Act (INA) and the Public Health Service Act, the Secretary of Health and Human Services promulgates regulations outlining the requirements for the medical examination of aliens seeking admission into the United States. The Department of State (DOS) and U.S. Citizenship and Immigration Services (USCIS) in the Department of Homeland Security designate licensed and experienced doctors as either Civil Surgeons (in the United States) or Panel Physicians (outside the United States) to give these medical examinations. In performing these examinations, designated physicians

use technical medical screening guidelines provided by CDC. The purpose of the medical examination is to identify, for DOS and USCIS, applicants inadmissible because of health conditions.

The required medical examination for refugees presently does not address some important current public health issues. To address some of these issues, CDC, in collaboration with DOS, has established a pilot program for expanded assessment and treatment among refugee populations. This program has proved successful for targeted groups of refugees and specific conditions, such as malaria, intestinal parasites and multidrug-resistant tuberculosis. For example, during the large population movements of 8,000 Liberians from Côte d'Ivoire and 10,000 Somali Bantu from Kenya, refugees were given presumptive treatment for malaria and intestinal parasites.

#### *In-transit and On-arrival Prevention*

HHS and CDC also have precautions in place to detect infectious diseases in people in-transit to or on arrival in the United States. In accordance with 42 CFR Part 71.21(b), CDC requires the commander of an aircraft destined for a U.S. airport to report the presence on board of any death or any ill person among passengers or crew to the quarantine station at or nearest the port of arrival. An ill passenger is defined as a person with diarrhea or a person with a temperature of 100°F or greater accompanied by one or more of the following: rash, glandular swelling, jaundice, or a persistent temperature of more than 48 hours. Upon

learning that a person exhibiting any of these signs or symptoms is on board, the captain or designee must immediately contact Flight Control, who in turn contacts the quarantine station at or nearest the port of arrival. CDC Quarantine Stations have established protocols with state and local public health authorities for handling ill passengers, coordinating care with local hospitals, and handling of contacts.

In the late 1960s, before the Division of Quarantine came to CDC, over 200 U.S. ports of entry, overseas Consular Affairs offices, and maritime vessels were fully staffed, including medical officers. During the 1970s, after the eradication of smallpox and the perceived diminishing of infectious disease threats, port presence was significantly downsized and covered only 6 ports of entry. Recent events have shown that there is once again a need to revitalize this capacity, and CDC is in the process of revamping its quarantine infrastructure.

CDC currently has 11 Quarantine Stations at our largest ports of entry and we continue to increase our presence at U.S. ports of entry. This past year we have increased the number of Quarantine Stations in the United States by three and plan to have up to 18 stations by the end of this year. CDC's goal is to have 25 stations at ports of entry in FY 2006 that represent over 80% of international arrivals entering the United States. We also are working to enhance the capacities of the existing stations by employing additional medical officers and epidemiologists to carry out critical functions. Station officers routinely evaluate

travelers arriving from affected areas by visual inspection of all travelers as they disembark and responding to reports of ill passengers on conveyances.

In the event of a known outbreak, other steps can be taken to prevent introduction and transmission of disease. For example, CDC would provide guidance to in-bound travelers on monitoring their health and reporting illness to appropriate authorities. This may be accomplished by use of videos or public announcements on the conveyance prior to arrival, distribution of Health Alert Notices on arrival, and posters or public announcements posted in airports.

#### *Post-arrival Prevention*

Mechanisms have also been put in place to prevent transmission of disease in the event a person was infectious while traveling, but whose infection was not determined until after arrival in the United States. If a suspected-contagious passenger is identified prior to landing, CDC officials meet the flight and obtain location and contact information from both passengers and crew members before disembarkation. However, when a case is identified after disembarkation, CDC relies on a manual system of gathering, compiling, and processing data from flight manifests, customs declarations, and any other available sources relevant to the case. Quarantine stations routinely work with state and local health departments to contact passengers who may have been exposed to an infectious disease during a flight and provide guidance on what to do, including symptoms to look for, or post-exposure prophylaxis or vaccination. In most instances, these

are limited events and only involve one aircraft. However, during the outbreak of SARS in 2003, this notification process was determined to be ineffective for an outbreak that would require notification of passengers on more than a few flights, primarily because this is a manual paper-based process that is slow, labor-intensive, costly, and dependent upon possibly obsolete or inaccurate data.

In response to the need for timely and efficient methods to trace passengers on an aircraft that may have been exposed to an infectious disease, several steps have been taken. CDC has developed a passenger locator form that can be used to gather emergency contact information on passengers and scanned into an electronic data base. This form could be used when a quarantine station is notified of an ill passenger on board an aircraft, or could also be used during a global outbreak to collect emergency contact information on all travelers on flights coming from affected areas. This form has been shared with U.S. airlines and international partners including WHO and the International Air Transport Association. In addition, CDC has developed an electronic database that will be able to capture emergency contact information on passengers. CDC continues to work with our federal and private sector partners to improve our ability to notify passengers of a possible exposure.

The CDC website is also a venue to alert health-care providers about infectious diseases, the symptoms to be aware of and a reminder to discuss with patients if

they have recently traveled to areas of concern. It was used widely by providers during SARS and most recently during the tsunami that hit South Asia.

Infected human passengers are not the only potential sources of infectious diseases imported through international travel. Zoonotic infections, or diseases that can be transmitted from animals to humans, can be introduced through imported animals and animal products, and animals, like humans, can be infectious even if they do not appear to be sick. According to the U.S. Fish and Wildlife Service, the United States imports over a quarter of a billion live animals every year. To reduce the risk of importing exotic zoonotic diseases, CDC administers the Foreign Quarantine Regulations found in 42 CFR Part 71 allow CDC to regulate and restrict the importation of animals, animal products and other related cargo. In response to specific disease threats including avian influenza, Ebola hemorrhagic fever, monkeypox, rabies, *Salmonella*, SARS, and yellow fever, CDC currently regulates the importation of dogs, cats, small turtles, nonhuman primates, and bats, and has prohibited the import of certain African rodents, civets, and Asian birds. Should new threats emerge, these regulations can be used on an emergency basis to regulate or restrict the importation of additional animals or animal products to reduce the risk of inadvertently importing the pathogens along with the animals.

### **Imported Lassa Fever: A Case Study**

When SARS emerged in 2003 and spread to over two dozen countries, it necessitated implementing and enhancing many of these containment measures.

By doing so, we were able to contribute to keeping the number of U.S. cases relatively low. Another, more recent example that received less national attention, but is quite relevant to today's topic, was an incident in August and September 2004, when a New Jersey resident died from Lassa fever after returning from West Africa. Lassa fever is an acute viral illness that occurs in West Africa. It is zoonotic, or animal-borne, and in areas of Africa where the disease is endemic—that is, constantly present—it is a significant cause of morbidity and mortality. While Lassa fever is mild or has no observable symptoms in about 80% of people infected with the virus, the remaining 20% have a severe multisystem disease, characterized by fever, muscle aches, sore throat, nausea, vomiting, and chest and abdominal pain. Overall, about 1% of infections are fatal. In the 2004 case, the patient became ill in Sierra Leone and flew to New Jersey via London. Upon arrival in Newark, he took a train to his home. Within hours of arrival in the United States, he sought treatment and was hospitalized. After several days of hospitalization and before a definitive diagnosis could be made, the patient died. Lassa fever was subsequently confirmed by CDC.

CDC worked closely with the New Jersey Department of Health and Senior Services, the airline and rail carrier, the hospital, commercial laboratories, and other partners to identify persons who may have had contact with the patient or his body fluids. The investigation identified a total of 188 at-risk persons, and it included searching for airline passengers who had been seated within six feet of the patient. Passengers were traced by using information from travel reservation

records and customs declaration forms. Nineteen passengers were identified as potentially at-risk, and 16 of those were ultimately contacted, 13 within five days. All passengers who were contacted were followed until the end of the 21-day incubation period for Lassa fever, and all were healthy. This incident and response illustrates the need for detection and containment measures as well as the importance of collaboration with state, local, and industry partners. It also highlights how increased international air travel contributes to a need for enhanced preparedness to detect and respond to emerging infectious disease threats.

## **Conclusion**

The current Marburg hemorrhagic fever outbreak in Angola reinforces the importance of global surveillance, prompt reporting, and adequate containment measures to prevent a localized outbreak spreading to other countries and becoming a pandemic. It underscores the need for strong global public health systems, robust health service infrastructures, flexible quarantine and containment measures, and expertise that can be mobilized quickly across national boundaries to mirror disease movements. CDC will continue to collaborate with state and local health departments, industry partners, other federal agencies, health care providers and health care networks, international organizations, and other partners. A strong and flexible public health infrastructure is the best defense against any disease outbreak.

Thank you very much for your attention. I will be happy to answer any questions you may have.